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ace C. Porter and F. K. Ovitz, conducted their investigations at the Pittsburgh station while it was under the technologic branch of the Geological Survey, the work being a continuation of the fuel investigations begun several years ago at the Louisiana Purchase Exposition, St. Louis, Mo. The results obtained at that plant showed that the work of determining the fuel values of the coals and lignites in the United States with a view to increasing efficiency in their utilization would be incomplete if it did not include systematic physical and chemical researches into the processes of combustion. Hence in their later investigations the authors carried on such researches, concentrating attention on those lines of inquiry which promised results of economic importance. This bulletin is a report on an investigation of the volatile matter in several typical coals—its composition and amount at different temperatures of volatilization.

UNIVERSITY AND EDUCATIONAL NEWS

THE state legislature of Arkansas has appropriated \$350,000 for the erection of four agricultural schools and \$500,000 additional has been raised by the cities.

At the recent meeting of the board of directors of Washington University it was announced that a research laboratory in connection with the chair of pathology and therapeutics in the dental school has been endowed. A well equipped laboratory will be in thorough working order at the beginning of the annual session, October 1, 1910. Dr. Hermann Prinz, who has filled the chair of dental pathology and therapeutics for the past ten years, has been chosen to take charge of the new laboratory.

At a recent meeting of the board of regents of West Virginia, the College of the State University was discontinued, and a department of medicine in the College of Arts and Sciences was established. This department will, as heretofore, offer the work of the first two years of the medical course, but the university will not award the degree of M.D. to those of its students who complete the last

two years in medicine at certain other colleges, as has hitherto been done. This preliminary medical work will be improved, and may be counted towards the degree of B.S.

At the College of Agriculture of the University of Wisconsin and the Wisconsin Agricultural Experiment Station Dr. Ormond S. Butler has been appointed instructor in horticulture to give his entire time to research work. Dr. Butler received his doctor's degree at Cornell in 1910 where he specialized in plant physiology. Dr. Frank B. Hadley has been appointed assistant professor of veterinary science. Assistant Professor E. R. Jones has been granted leave of absence for the second semester to study soil physics and drainage in this country and abroad. Conrad Hoffmann, assistant in agricultural bacteriology, who has been on leave of absence for a year studying soil bacteriology, in Germany, has returned and is giving a course in soil bacteriology.

MRS. HELEN THOMPSON WOOLLEY is assisting in the department of philosophy of the University of Cincinnati this winter.

DR. W. B. PILLSBURY, of the University of Michigan, has been advanced to a full professorship of psychology.

DISCUSSION AND CORRESPONDENCE

THE MENDELIAN THEORY OF HEREDITY AND THE AUGMENTATION OF VIGOR

TO THE EDITOR OF SCIENCE: One of the most interesting questions in connection with the Mendelian theory of heredity is whether the augmentation of vigor observed in crossing distinct varieties can be explained on the hypothesis of the pure gamete.

The following mathematical treatment of the subject may be of interest to some of your readers.

The most general expression for a Mendelian family breeding true to its mean is

$$(p^2(DD) + 2pq(DR) + q^2(RR))^n$$

for, if the array of individuals obtained by expanding this expression be crossed at random, we get the same expression for the array of offspring generation after generation.